Editorial

Hi, thanks for being reading this magazine that we have put so much efort to do. How many times did you found yourself reading dusty old mags several years and maybe decades old, searching for some part of text that you dont know by memory yet and missing that good old times of reviews and news that you were so anxious to know... How many times do you look at all those today magazines that talk about super PC systems, that besides being do powerfull machines still lack something that you cant hardly explain what it is.Retro Review is here to fill that gap, this project was created by Jorge Canelhas and Ian Gleghill to provide a common media for all retro computing fans scatered all over the world, an to reach a population that just wont accept emulators has an escape from todays mega powered and often anaddictive machines, furthermore we want to deliver fresh news on old computers, we arent here to copy or repeat old news from the mags of that time...

Thanks for your suport

Chief Editors

Jorge Canelhas Ian Gledhill

retro REVIEW

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Haage and Partner

Offer Discount to Retro Review Subscribers

Haage & Partner, Amiga's leading software developer, which produces gems like Page Stream (on which your beloved magazine has been made), ImageFX, Amiga Writer etc, has given us the honour of offering a special discount to all Retro Review Subscribers! So, Subscribers have a special price of 35 Euro on either Amiga Writer Software, or Art Effect. To use your software discount, just go to http://www.haage-partner.com, and make your order: on the comments field write 'Special Retro Review Price 35 Euro + shipping' and you save yourself some cash! Aren't you glad you subscribed!

RetroMusic mp3 streaming!

If you have a soft spot for the music created by SID and Paula (or even an AY-3-8912 or POKEY) you`ll like this mp3 stream - nothing but game music audio. Just tune your mp3 player into Kohima at:
http://194.29.195.240:8000/
http://130.240.194.204:8000/
http://194.52.18.7:8000/ or
http://drakenrelay.mine.nu:8000/
and treat yourself to 44KHz non-stop game music!

MAME.DK overloaded

It seems the latest version of MAME

(version 0.56) was a little too much for mame.dk to handle - the bandwidth was so high from downloading the latest (and largest) ROMS that they had to disable anonymous downloads! If you use the service they provide, how about a small donation to their cause? Bandwidth doesn`t come cheap, as these guys are finding out!

Amiga Forever 5.0 released

UAE Mulation screen

Cloanto (http://www.cloanto.com) have released a new version of their Amiga emulation package. Apparently containing a Just-In-Time compiler, it seems the only official Amiga emulator package just improved again. Now also emulating CD32 and CDTV, it should even be able to play JetStrike CD32 (worth the money alone!)

First MARP Olympiad online

The first MARP (MAME Action Replay Page) Olympiad is underway currently, with it seems the USA leading the tournament. Unfortunately it`s too late to enter now as the qualification is over, but it`s still worth a look and maybe competing in the second olympiad...? It`s all at http://marp.retrogames.com.

MyAtari Lauches Site

MyAtari lauches site and new issue, check it at http://www.myatari.org

my atari

Petersplus Sprinter 2000

Peters Plus has new Sprinter Ready

Peters Plus has Speccy-compatible Sprinter 2000 ready for shipment! For more details go to http://www.petersplus.com.
All being well we shall be reviewing this new super-spectrum next issue!

Sinclair QL is a grown up !!

The Sinclair QL is 18 years old on the 12th January 2002. Expect it to be out on the town for late nights in pubs from now on.

Amstrad buys rights

Amstrad is buying the copyrights of old Spectrum software, what for, we still dont know... rumours abound of an official spectrum emulator for the em@iler...

AtariAge now with manuals

AtariAge (http://www.atariage.com/) are currently writing up all the manuals they can find. Need a manual, or reckon you can help? Check them out....

Amiga.org Attacked

Amiga.org, was attacked again and is on minimal services, hope it gets better soon .

Amiga OS XL is out

Haage and Partner released Amiga OS XL last month. This new software allows you to run Amiga applications on your PC just like if it is an amiga, but be warned this is NOT an Amiga emulator and old games wont problably run. Most OS legal software apparently runs well.

Know Any news ? and want to tell about it ?

Drop us a line to news@retroreview.com, we'd love to hear about it.

Personality of the month

FBI - Thomas Eberle

Each month, Retro Review will try to bring to you a personality from retro computing, this month FBI, ZX Spectrum user and CEO of Sintech accepted to talk to us and awnser some questions....

RR : Hi, FBI, everybody who hangs out on comp.sys.sinclair has heard of you, but whats your real name, tell us a little about you.

FBI : My name is Thomas Eberle. I am owner (and founder) of the SINTECH-Shop and also I am managing the Spectrum-User-Club Germany.

RR : What was your first computer ? Can you tell us some special memories of it ?

FBI : Well, my first one was a 48k Plus. I really wanted a C-64, but my father said this is bullshit and I had to take the Spectrum. Thanks very much Dad, this was a very good choice.

RR : Are you actually a retro computer user on a everyday basis or just as a hobby or business?

FBI: From all a little. I am Spectrum-User, programming and playing games. Of course I work on the Spectrum also for our club and club magazine and I do a lot of business with Spectrums, buying, selling, repairing. Iam also a collector, when I get very rare items in the shop I always keep one for me.

RR : Sintech online is one of the last Retro stuff shops in the world, do you make a living from it or do you have an extra source of income ?

FBI : Maybe I could live from it but I think I live much better when doing another job also.

RR : For how long has Sintech been around ?

FBI : Sintech was founded in 1994.

RR : What's the size of the retro community on Cologne / Germany ?

FBI : There is a club with about 80 members in Cologne, my club is situated here in Filderstadt with about 60 members. Some people are members in both clubs. These all are active or less active Spectrum-Users. The Retro-Scene for all computers in Germany is very big, I can´t give you a number.

RR : Sintech is problably the most successful Retroshop there is, so whats your next project going to be ?

FBI : We are the only Spectrum-Online-Shop worldwide but because of the long lists we didn´t put any pictures to the products. As next project we plan to do a special information site with pictures. As on the products side we are working on a project and want to sell IDE-Interface and Harddisks for Spectrum. Also we now got a wider range of products for other computers, for example now we stock AMIGA CD32 titles and Atari Jaguar consoles. But main business is still Spectrum.

RR : I see the MB02 as your flagship

product, can you tell us a little more about it apart from what's on your page ? What peripherals/add-ons are in the pipeline for it, can you reveal anything new for us ?

FBI : We are very glad that we can offer the MB02. I saw it first time in 1993 when it was a handmade product by a slovakian guy. We met a coder named Jaxon Hollis who was lucky user of one of these handmade interfaces and we forced him to get the plans to make a production of these interfaces However, we never thought that it will really happen and a problem is that Jaxon was always out of money. But then two other people heard of it and they took over the plans and parts from Jaxon Hollis and made it possible. It took 2 years to finish the first few MB02´s and maybe two other years to promote it really. We are not the producers, but we took over the distribution for the interface.The reason why I think it is the best one is because of the BS-DOS. It is a very good user-system, with only a few additional but powerful commands to the normal Spectrum Basic. It uses a tape-emulation system what means that the disks are virtual tapes. You can type in LOAD "" and the first file on the disk will be loaded. You can set a pointer to tell the computer which one is the next file or you can type LOAD "name" and the first program with this name will load up. As for this, I can copy most of the tape games to disk and then they will load from disk without adding some special disk-loading routines orcommands. The only wrong thing with the MB02 is, that is came 5 years too late, but still there is no other interface which is nearly half as good as the MB02. Really not.As for future plans, there are no special ones, only we are interested in a new Spectrum Hardware project like modem or IDE interface and will suport it.

RR : One of the complaints i hear about the MB02 is its editor some people are more keen of a 128 kind editor - though we understand that most users use the thing in URS0 just for assembler ?You think a 128 style editor would be more apealling to less enlightened users ?

FBI : The 128k editor is not really good for coding as it will not show the keywords with one keypress. This is a great advantage of the Spectrum and I would never miss it. Just pressing "j" and I have LOAD on the screen.No other computer got this. However, if somebody can´t work with that I don´t think that he is a real Spectrum - User, but that´s only my opinion.But I ask yourself: When did you type your last Basic listing in the 128k Editor? Coders do not work in Basic, they write their programs in Assembler. What is important in Basic are the disk commands and they are pretty easy to find. But to answer your questions: Yes, maybe with adding the option of choosing between 128k Editor and 48k Editor we could have sold 1 or 2 MB02´s more, but we never heard this from users, we only heard this from people who are considering to buy it. Anybody who ever worked with the MB02 will never want to miss it.

RR: What software titles for the MB02 are available ?

FBI : Far too much to list here. Various game like Ghostbusters have been rewritten for MB02 and its DMA-Mode. This means these games are up to 50% faster than on normal Speccy and so more playable. There are a lot of utilities also, the most important are Discobolos for copying between MS-DOS and BS-DOS and .TAPMASTER for using .TAP - Files on Spectrum. So I can download TAPfiles from the internet, transfer via Discobolos to MB02 Disk

and then change it into normal Spectrum-Format using .TAPMASTER. And there is also TAP-Creator to do the same thing vice versa.

RR : Is there any other 'old computer' club on Sintech ? Atari ? MSX

FBI : No.

RR : Sintech has a mag of itself, how can anyone subscribe / get the mag ?

FBI : It is not the Sintech mag. The magazine is made by the Spectrum-User-Club and its members. It consists of SUC-SESSION, a 24 paged papermag in German and little parts in English and SCENE+, a discmag containing the newest programs. Both can be subscribed for 50,00 DM (about 25 Euro) from us. There are several ways to pay for it, bank-transfer, postal orders or using PAYPAL. But we probably will raise the price for next year as some costs (postage) has gone up.

RR : hanks for your co-operation, are there any final comments you would like to add ?

FBI : In the past years there were a lot of things happening which was not good for the Spectrum community. I remember in 1995 the stop of the magazin SPECTRUM UK without any reason and without paying back the subscriptions. The mag had 7000 users as I heard and maybe many of them stopped after this. Then 2 years ago the FORMAT magazine stopped also. Bob Brenchley gave some comments that he is so ill and cannot continue,however it just stopped and he nor informed his readers by letter neither paid back the subscriptions. So Spectrum community lost again. I hope your magazine will be sucsessfull and when you ever decide to stop, do it in a correct way and not like these people did. SINTECH and the Spectrum-User-Club are here and we will ever be there as long as people are interested in Spectrum.
Please reprint our adress for contacting us.

Bye, Thomas

So this is the end of our first interview, to close this article, all i have to say (and no im noit being paid by Sintech :)) is that ive done business with Thomas and i have been satisfied, once we had a mial problem and everything was sorted out promptly, As for our mag, all we can say is that we will try to make it the best possible in every way we can, and the readers satisfaction is our PRIMARY goal. To check Sintech see details on this page.

Jorge Canelhas
22 September 2001

W a l l y ' s P

SpecNG is a new team that intends to convert spectrum classics to today's platform (PC). To quote them: "The main purpose of Project Spectrum New Generation is to convert classic games from the ZX Spectrum computer to the most recent technology available and keeping the playability and game as close as possible to the original games. It is our intention to release all games as Freeware so that everyone can enjoy them".

Plese bear in mind that we are reviewing a beta that is making progress every day so what looks bad today may (and probably will) look good in the near future due to all the work involved.

If you want to get Three Weeks in Paradise NG version, just jump to their website at http://lineman.nu/specng, and prepare yourself for a 20MB download (if you think inflation is hard just check this...), it took us 30 mins on a ADSL

line to download it all. The install procedure is very simple and intuitive creating no problems at all; it took about 2 minutes on my AMD K6@366 to install. The loading of the game takes about a minute - not bad compared with the 4 minute tape loading procedure of the old days!

As soon as the game loads you get a cool intro screen wich is actually a pic of the games box, and then the press any key sign, and we are rolling.... First screen looks good - nice graphics... and then wally starts moving, and the first thing you notice is the jerky animation. Come on guys, another frame or two will make the 20 MB download worth it. The same goes for when wally jumps - that typical head turning toward the screen but still a few frames short, plus at some points the colours seem to flicker. Worst of all, though, is the speed, the game is SLOW on a AMD K6. However, since many people probably have much better machines that may be acceptable. I can't leave this out of the scoring because it hurts playability a lot and since my AMD has 100 times the MHz of a speccy, this is a point the SpecNG crew really should be able to fix. Now for the good part: the game is there - the involvement level is very close to the original's - so i believe that the goals have been attained in the most part. Remember also, this is just a beta, freeware and the teams first project - can't wait till these guys get to work on Sabre Wulf (Ultimate allowing...).

The sound is great, cool music (all orchestral), and if you really like it you can hear the music in mp3 format which is what the game uses (again a huge load for the computer just for the music).

After talking to the lead programmer of the project, Marco A.G. Pinto, about these issues he stated that the game was made to take full potential of todays technology and thus a Pentium 3 at 1GHz is required to play the game.

Before... After...

Above you can see the first screen of Three Weeks in Paradise, Spectrum version, with the few colors it allowed and the unavoidable color clash that was a trademark of the machine, 2 frames per movement and so on. The game speed was great considering the 3.5MHz 8bit Z80 CPU, but in game music could became annoying after some time, especially as you struggled to solve the puzzles in the game.

I just had to use the whole page width so i can pass some idea on the spectacular pics. Check the elephant skin, just great... a background could have been made but who knows, maybe in the future... the colour blur you notice when Wally jumps is, according to the programmer, a Dark Basic bug.

To round it up, the game is pretty cool but doesn`t meet todays standards in playability. If we check the game in a straight forward manner you see it is only a repainting and re-orchestration and an absurd system requirements sheet. However, and I can`t emphasize this enough, it *is* only a beta, and it's free! As a final note I was authorized to say that the crew's next conversion is High Noon, and we are looking forward to take a peek at it.

Jorge Canelhas

What rocks :

-The game, one of the greatest games ever made.
-The graphics, have you ever imagined the old titles in new machines? Now you have at least one.
-The commitment, it's great to see people still interested in developing what others forgot.

What sucks :

-The animation (but remember - still a beta!)
-The size, 20MB is just too much for what you get.
-The speed, come on guys even a Amiga 1200 could do better.

70% total score

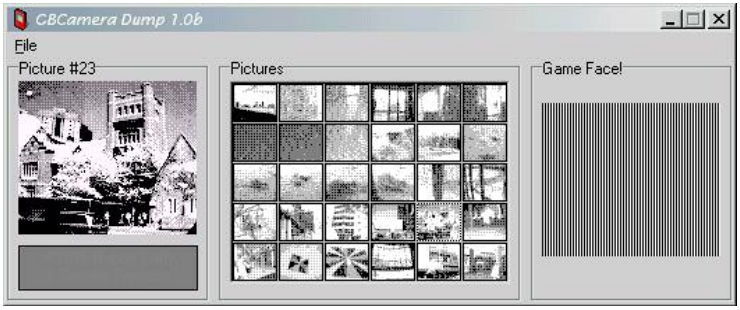
THE BUNG

E m u l a t i n g

Some 12 years ago now, Nintendo produced the Gameboy - and it was good - as were many of the games. In the 21st century, however, many of those games have been deleted... but what if you want to play them today? *Chris Johnson* knows how.....

I was alerted to the Gameboy Xchanger by Bung of Honk Kong when I heard about a lawsuit from Nintendo barring its sale in the United States. It's the same way I decided to buy a Diamond Rio. The package I purchased included an Xchanger Gameboy cartridge (cart) reader/writer and a 16 megabit flash cart (2 Megabytes). To give you some idea of what that size means. The original games are 32K. Pretty much everything up to and including Star Wars Episode 1 Racer fits in 2MB, the new Alone in the Dark does not.

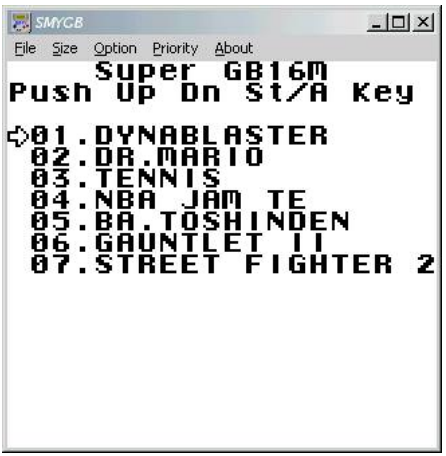
The Xchanger lets you dump (copy) the ROM and RAM of any cartridge to your hard disk. It also lets you write a ROM to the flash cart, or write RAM to any cart. The bundled utility is a simple command-line DOS app, but works fine.



One of the best ways to use a GB camera - read your files on a PC!

As an added bonus, since many Gameboy games are far smaller than 2MB, you can combine multiple games

into a single ROM with a little menu at the beginning. Only black and white games are supported with the menu that I have (hybrid ROMs are forced into black and white mode), but as Liberty has similar limitations and colour ROMs are typically quite large it doesn't make a lot of difference. When playing a game loaded onto a cartridge it plays



No more carrying 16 carts around at a time for long journeys...

through a menu. Action Replay (Gameshark) cheat carts work fine.

Nintendo would have you believe that the device is only a piracy tool, but that's just not true. Saying that it is, is to dismiss the hundreds of homebrew Gameboy projects2. The Gameboy demo scene and music packs alone take me back to my fondest 286 and 386 memories. Bung, now more or less defunct, ran several programming competitions, leading to some very playable games. The people behind Liberty have picked up the slack with their Freedom GameBoy Developers Competition. Although Bung have closed up shop there are a number of other similar devices, including one for the Gameboy Advance. Check out Lik-Sang3 or Mr Flash4.

It's also about art. Devices like the Xchanger are one of only two ways of getting pixel-perfect photos from a Gameboy Camera to a PC. And music. Music composition software has been written for the Gameboy that no emulator can hope to cope with. There are few other ways to add that unique chip-music feel to your retro-themed music.

It plugs into your parallel port, although there's a project at the moment to build a USB interface for it. To properly write information it needs a little more power than a normal parallel port offers. As such you can use 6 AAA batteries or a power adapter. The power adapter from that first little Canon bubblejet printer (BJ-10) is perfect. Funny thing is that the port on it is the same gender as a normal parallel port, so you'll need an adapter or cable to connect it.

Where to find it

Not easy these days, owing to pressure from Nintendo. eBay as usual would be a good place to start. Also check out Bung's web site at

http://www.hkbung.com

Liberty Emulator

A GameBoy on your Palm

Sometimes you`re not able to take a GameBoy with you... but you may still want the occasional game of Mario Land! In that case, transform your Palm with a little help from *Chris Johnson.*

Liberty is an emulator. It allows you to play old Gameboy games (minus the sound) on a Palm OS device. Games are not re-released, they're not reprogrammed, they're just copied off the cartridge, wrapped in a bit of Palm database code and synced. It's mostly written by the same guy that wrote a batch of Game & Watch clone games for the Palm so true to the originals that Nintendo has had him cease distribution of them.

I downloaded Liberty and tried it with a couple of my games. Straight away I knew I had to buy it. There was even a wonderful bundle that included a registered copy of Afterburner. Afterburner is an "overclocking utility" – it makes the Palm device run faster than normal. This chews through batteries, but it's necessary to get the emulator running as close to full speed as possible. I can get up to about 34MHz and I'd have to say that it's pretty close to full speed on most games, and very playable. Newer Palms run standard at that sort of speed, or faster, and should get close enough to full speed that you won't be able to tell the difference. Afterburner is also useful for speeding up other applications, like Avantgo.

Now you too can have a "Game & Watch" on your Palm. Wonder if the "Watch" bit works...?

Other limitations of the emulator are the lack of link and IR ports and no support for the standard save feature. It does however have the ability to save at any point, useful for games with no save feature like Double Dragon or Pocket Shanghai. And it natively

supports the Palm Gamepad by World Wide Widget Works, for that real Gameboy feel (and a Start and Select button).
Without a cartridge reader, Liberty is a little restricted in the titles you can legally use. Freeware ROMs are easy enough to get hold of, but most of the interesting stuff there requires a colour Gameboy, or at least one that properly supports sound. I'm sure that most owners find their way to those web sites and IRC channels where you can download commercial ROMs. This is technically illegal and morally questionable. But with the Xchanger

Even use a gamepad for the ultimate in Gameboyness!

and Liberty my Gameboy collection works like may peoples' CD collections. Buy the CD, rip it, encode it and play it on something different. Buy the game, dump it, wrap it and play it on something different.

My Palm OS device, a TRGpro, is

32 games at a time... unless you make multicarts using Bung, of course...

particularly suited to a collection of Gameboy games. With a 128MB Compact Flash card to play with I reach the emulator's 32-game limitation well before I run out of space. This limitation can be bypassed by creating compilation ROMs as described above for the flash cart. Other new Palm devices with card slots will also enjoy the ability to take a large number of games with them in their pocket.

There are some compatibility issues, for both systems. The emulator only plays games that support the old black and white Gameboy. You can pick these games by looking at the cartridge – if it's very square with a corner missing then it will work. Specific examples of problems include; F1-race doesn't like

being loaded onto a flash cart without a quick tweak. And when you play it on the emulator the track never goes round a corner (!). There are also some display issues with Hexcite – which is a very interesting little puzzle game that I would have liked to have on my Palm. Screen refresh speeds, blurring, can be an issue on older Palm devices but since the games also run slower it isn't that big an issue. Either way, you'll be wanting to stay away from action games with a lot of screen movement. I find the Game & Watch galleries' classic mode to be ideal.

Compilations and portability. That's what these products offer. The same thing that a good CD drive and an MP3 player offer music lovers. Each product alone looks on the surface to be a casual pirate's wet dream, but scratch the surface or combine the products and you get one of the best portable gaming solutions around.

What do YOU think?

Retro Review aims to deal with all things retro - however, it could be argued that the Gameboy is not retro (despite it being over a decade old!)

Do you want more articles like this, or is this out of the scope of the magazine? Let us know what you think! Mail us at
iang@retroreview.com
jcanelhas@retroreview.com
Thanks!

Links to the Outside World...

Bung website	http://www.hkbung.com
Mr Flash (similar to Bung)	http://www.mrflash.com
Various console accessories	http://www.lik-sang.com
Gameboy developers website	http://www.devrs.com/gb/
Liberty emulator homepage	http://www.gambitstudios.com
All sorts of PalmOS software	http://www.ardiri.com

Happy Birthday to You!!

In this, the first issue of RetroReview, we pay homage to one of the most influential computers in history - the one that brought computers to the masses. Ian Gledhill takes a look at the past, present and future of this ever-popular machine.

Long, long ago, two things symbolised the computers of the age - size, and price. Then came the ZX80, and it was good. Or rather, it was cheap - and indeed for the price it was very good. However, the lack of a moving display meant that the uses for this machine were somewhat limited. Only logical, then, that the creator of this machine, one Clive Sinclair, should improve this beast with a new machine capable of moving graphics - enter the ZX81.

Retailing at under £100, and marketed in high street shops, the ZX81 was the first commonly available computer to hit the home, and the first to make an impact on the general public. Perhaps what is most intriguing, however - certainly to the modern 'connoisseur' - is what people have achieved with this machine, especially given the basic spec of 16K RAM, no colour, no sound and a CPU managed display (so the CPU had to cope with drawing the display as well as running code).

... one program stands out as perhaps one of the most impressive feats of programming.

The ZX81 wasn't just confined to the UK - in fact it made a very brief appearance

over in the States, before it was replaced by the Timex 1000 - which was basically a ZX81 with 2K of RAM and a "Timex Sinclair" badge on top. It was also slightly slower as the poor Z80A in it had to cope with drawing 60 frames per second instead of the ZX81's 50, so leaving less time for running programs. 2 years after the birth of the ZX81 came the TS1500 - a 16K ZX81 housed in a case similar to the Spectrum's, complete with authentic "dead-flesh" rubber keyboard. Strangely, this machine didn't take off very well because the other limitations of the ZX81 were still present, and people had moved on to the wonderful world of colour and sound by this time.

There are also clones of the ZX81 to be found - the Lambda 8300 being perhaps one of the more often seen varieties. These usually had sound (via a Spectrum-esque beeper) and a couple of extra graphics in ROM for games, like a space invader or a running man. However, they're not actually compatible with the ZX81 unless you put a ZX81 ROM in the machine.

How any game can be so atmospheric with no sound, colour or hi-res graphics is a ability seemingly lost to this day

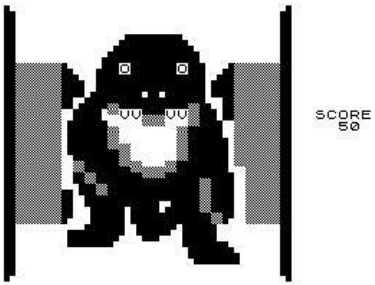
Although the first programs for the ZX81 were invariably very simple - particularly those written for the 1K ZX81, which was the machine as it came out of the box - one program stands out as perhaps one of the most impressive feats of programming. Given 1K of memory which must also hold the display memory, Artic Computing somehow managed to produce a working playable chess game. Of course it would be beaten by later chess programs (not least, presumably, by the 16K version!) but nonetheless still a game of chess could be played. As long as you played as black. And had a board handy, as of course there was no graphical display.

The computer visibly going through its moves - a marvel of 1K engineering?

The following years were overseen by numerous ASCII-based creations, quite often of the popular arcade games of the time. Particularly Quicksilva released a number of reasonable quality conversions, including QS Scramble and QS Defender, along with Psion, also creating games such as Sorceror's

Island to fill in the gap in the roleplaying market.

To many, however, say the word “game” in conjunction with “ZX81" and you will get one fast response - 3D Monster Maze. Every computer should have a “killer app” - in this case, J. K. Greye Software’s flagship product. Long before Doom arrived on the gamer’s scene, players could be found tapping furiously on a small grey membrane keyboard with intermittent shouts of surprise as the words “RUN - REX IS BESIDE YOU” flash on the bottom of the screen. How any game can be so atmospheric with no sound, colour or hi-res graphics is a ability seemingly lost to this day. Do not try this game if you are of a nervous disposition. If, however, you are of a gamer’s disposition you must surely try the



OK, so it doesn’t look scary here. Try it on a big TV with the light off and say that.

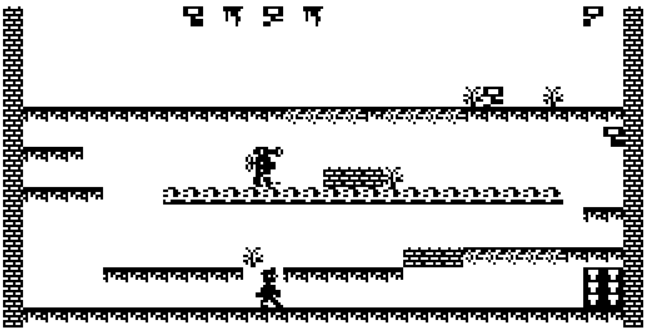
grandaddy of the home computer sweat-inducing adrenaline pumpers.

1983 also saw the birth of a new generation of ZX81 games. The question: “When is a lo-res computer not a lo-res computer?” must be answered with the words “When Software Farm have programmed it!”. It was realised that because the CPU was in charge of the display, changing certain registers could create strange effects - in fact,

Having pushed the software of the ‘81 to its absolute limits, enthusiasts moved onto the hardware...

changing the “i” register relocated the character map. So, by changing the i register at a particular time to different location in memory, a different character would be printed! Unfortunately this could only point to the first 16K - i.e. the ROM - so unless you owned a 64K RAM pack which removed the ROM shadow in the second block of 8K, or did some internal modification, you could only use character values which happened to be somewhere in ROM. This was still used to great effect in certain games, however - particularly games such X-Tricator, a rather fine Defender game. CRL even released a toolkit to allow BASIC programming in hi-res - of course it had to come with a small booklet to describe which values of i give which patterns as there is no easy translation from bit-pattern to i-value!

So where to go from here? Having pushed the software of the ‘81 to its absolute limits, and quite a bit further, enthusiasts moved onto the hardware. Even at the time there was released a pageable, expandable RAM pack - plug



Manic Miner - but on the ZX81! Wonder what Matthew Smith would think of it if he saw it?

in a 16K RAM pack to the ZX81, and then plug another 16K on top of that module. And then another 16K on that.. and so on. Theoretically, even in 1983, given enough money and a high enough ceiling, the ZX81 could have 1MB of RAM. There were, of course, some tiny problems with this. At about £50 per 16K, 1MB would cost £3,200 - and that was massive in those days! Secondly, the stack would be about 5 metres tall. Lastly, and perhaps most importantly, at a rate of 7 minutes 15 seconds for 16K (about average for a game at the time), it would take more than seven and a half hours to save your program!

Luckily, insanity took over later in the 1980's and 1990's and people have created their own projects. Take, for example, the wonderful ZX96 creation. Up to 4MB RAM, Floppy disk, Hard disk, parallel and serial ports, PC/AT keyboard, LCD video controller (so you can use laptop screens). This does make you wonder if the system suffers from RAM-pack wobble like all the old ‘81s did...

There has also been some new software produced (using the word “new” fairly liberally” - the all-time classic Manic Miner has been ported to Zeddy, hi-res graphics and all. Also, hi-res graphics are being covered more and more with packages released to help programming in hi-res - even with a faster display update than in lo-res mode!

The future for the ZX81 seems fairly static - there is one user group still active for the ‘81, which seems to have no intention of giving up as long as their trusty machine keeps working, and the ZX-Team website is well worth a visit, especially if you fancy hacking around with simple hardware (of which the ‘81 is a prime example). Be warned, however, that the ‘81 has a problem which is not shared with many computers - the TV modulator seems hated by all modern TVs so don’t expect a nice picture unless you have an old TV to go with it. Luckily, thanks to ZX-Team, there’s a simple way of connecting composite video to the ‘81, but of course this

requires soldering onto the board itself so not to be tried unless you're prepared to sacrifice the value of your trusty ZX81.

So Happy Birthday ZX81, and here's to another 20 years of advancement!

Ian Gledhill

A modern ZX81. No, actually THE modern ZX81. Intel most definitely outside...

Things to do with a ZX81

The ZX-Team don't just use Sir Clive's ZX81. Oh no, not only do they change it completely into a whole new machine like the ZX96 (of course still with the original motherboard) but they also tell us how to do it! Check out their homepage for home-brew projects including:
Internal RAM expansion up to a whopping 32K! No RAM pack wobble here!

A Fast-mode LED! Yes, you too can have a light on your '81 whenever you go into Fast mode!

Composite display! About the only way to get a good picture on a modern TV!

Links to the Outside World...

ZX-Team	www.zx81.de Everything you need for the ZX81!
FTP site	ftp://ftp.nvg.unit.no/pub/sinclair/zx81 Get your games here...
The Ultimate Jet Set Willy Fan Page	members.nbci.com/jetsetwilly/ The only place to find Manic Miner ?

Opinion Poll

As a new project, we need all feedback possible, if you fill out and send us this form, you are already contributing a lot to make this you favorite magazine.

Thanks
The Retro Review Crew.

Please Draw a circle araound the number that you think best discribes what you expect from Retro Review, or the item that better expresses your opinion.

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   - 1 - Too Small.
   - 2 - Its OK.
   - 3 - I dont really care about the format.
   - 4 - Too Large.

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   - 3 - Neither good or bad.

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   - 2 - Nor Happy or Sad.
   - 3 - Im disapointed.

4) Would you recomend it to a friend ?
   - 1- NO WAY.
   - 2 - Maybe i would.
   - 3 - Definatly.

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   - 1 - Arcade.
   - 2 - Computers.
   - 3 - Consoles.

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Jorge Canelhas
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2745 QUELUZ
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or just copy the question number and your awnser and mail it to:
ideas@retroreview.com
Feel free to write down any ideas and comments.

JOUST

***Ian Gledhill* takes a look at an Arcade Classic from Williams Electronics. No maidens to be impressed here, just good, old-fashioned one-on-one battling (albeit with buzzards!)**

The art of jousting was a skill learned by many a knight in days of yore... and not one of them had probably ever seen an ostrich - let alone used one as his mount. However, Williams Electronics didn't let a small fact like this get in the way of their Arcade classic Joust (or its sequel for that matter).

'Realism' aside - the creators have gone for a simple approach: You are a knight on an ostrich, pitted against opponents of varying quality at the helm of their buzzard. All you need to do is hit your enemies with your lance higher than theirs. Simple, hey? Well, yes. As long as you have immense precision and know exactly how to beat the other knights, which is not easy, particular as the knights get harder and meaner. Believe me, a screen full of Shadow Lords (the toughest badguy in the game) is no picnic.

Of course there's more to the game than flying around hitting bad guys - but not much. There's a not-so-friendly pterodactyl who likes nothing more than to knock knights off their ostriches, though it can be beaten, if you know what you're doing and just happen to get lucky! There's also a chap called The Lava Troll. What he looks like nobody knows, but most knights know what his hand looks like as it reaches up and pulls them into the lava. Luckily this particular lava troll isn't fussy - if looks like a knight and tastes like a knight, then he's happy. This means even the occasional Shadow Lord snack, fortunately for other jousters. It's

Like any other troll, this particular Lava Troll is partial to a bit of Hunter meat.

somehow very satisfying watching your arch rival that you've been trying to joust for minutes getting caught by a huge hand in the lava, and flapping frantically but to no avail.

Another way of putting variety into a

So many eggs.. anyone for an omelette?

simple game is to introduce different levels - in this case, quite apart from the later levels starting with more Shadow Lords than Bounders (the lowest of the enemies), some waves have a particular meaning - for instance, the Egg Wave where you have about ten seconds to pick up the eggs before they hatch into Bounders (naturally, there's a lot of eggs to pick up!) - or the Pterodactyl wave which features the reptile from the beginning.

That about describes the game as a person would play it - except for one rather major point - 2 player mode. It's a fine game even with one player, but grab a friend and the game is rejuvenated! Of course you may put your friendship badly at risk in playing it too competitively, but hey, it's probably worth it - this really is a fine game when you're battling over the points (obviously the more points, the more lives you have - a new mount every 20,000 points). True, it can be easier with two people, but only if they're good - many a life has been lost by careless flapping and jousting your mate off his mount. Then again, if you're feeling belligerent, there's nothing quite like flying headlong into your 'chum' and watching his ostrich fly off into the distance without him on it. Strangely, games like this tend to be rather short lived as the Bounders have little to do except watch and smirk as you annihilate each other.

So what's wrong with Joust? Not a lot, it has to be said. The graphics are fine (especially for 1982), the sound is ample, and the gameplay is topnotch. Of course some may find the gameplay too simple, but for traditional high-score beating, it's one of the most fun blasts to be had for a virtual 10p.

Where to find it...

http://www.mame.dk

The MAME ROM - only really legal if you own the original arcade machine.

On eBay look for the Atari 7800 version - it's the closest to the arcade by far!

Joust - Williams Electronics Inc	
Graphics	7
Sound	6
Playability	10
Longevity	8
Overall	9

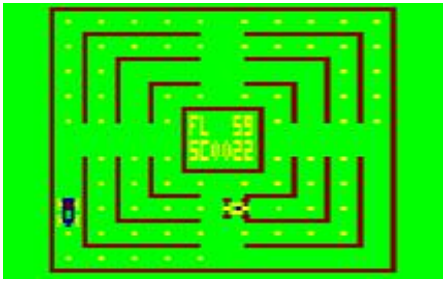
VZ-ALiVE

A little known computer in Europe is still used in the Southern Hemisphere - *Jason Oakley,* is largely respnsible for this, as an author of the VZ Newsletter. Here he gives a quick history of the machines common in Australia.

The VZ-200 family along with its successors began in 1982-3. They were made by a company in Hong Kong called Video Technology - affectionately known as VTech, and still in existence today building educational computers among other things. These computers were in competition with the current standing champion of the time, the Sinclair ZX-Spectrum. Other members of the family include the Laser 210 (mainly in Germany), the Texet TX-8000 (in England) and the Salora Fellow (Finland).

The VZ came with a standard Microsoft BASIC (as did most home computers in those days) in 16K of ROM. It actually had the TRS-80 ROM in it with parts of the TRS-80 ROM moved up in memory (possibly to subvert copyright restrictions). A Zilog Z-80 CPU ran the operation with the help of a Motorola 6847 Graphics chip which was capable of hires graphics at a resolution of 128 x 64 in four fantastic colours (green, yellow, blue and red). Can anyone say chunky? One of the main selling points of the VZ family was that it could be plugged into a monitor or the family TV set.

The early VZ-200's had a whopping 6k of RAM, but you could upgrade this with



The VZ version of Dodge'em, *Crash*. For those without colour, the car and dots are yellow and the background is bright green....

a plug-in module which provided an extra 16k of RAM. Later modules came out with a massive 64k of bank-switched RAM, which mostly went unused on VZeds as few programs supported

them. Later versions - the VZ-300 - contained plastic keys to replace the rubbery VZ-200 keys, a long spacebar to replace the slightly larger space-key, and more base memory.

Many other peripherals were produced for the VZs, including a Datasette cassette player, Lightpen, Disk Drive

A Laser 210 - someone recently found 6 of these mint in a warehouse- a nice little find at £100 UKP a piece on eBay.

and Joysticks (most games came with both joystick and keyboard support). Printers could be plugged in via a printer cable which connected to standard Centronics printers around at that time. The Disk Drive, which could handle up to two connected at once, plugged into the same slot as the memory expansion units, thus requiring the Disk Drive Controller to have a 'pass-through' connector to allow memory expansion units to connect simultaneously. Of course, many of these had to be imported: one well known importer was Laserlink - a small one-man company in Newcastle, Australia.

Dick Smith Electronics - the company which imported the computers into Australia and re-badged them as the Dick Smith VZ-200 computer, started a small newsletter called Interface which was later renamed Comput. Many small user groups popped up around the place, some bringing their own newsletters. In much the same way as for other machines of the time, there emerged VZed 'upgrades' in the form of a mouse, memory upgrades, charset changes, a new hires mode, a caps-lock, sound and speech synthesis, RTTY and the ability to control robots, among others.

Dick Smith released most of the early games in Australia and arguably the best were made by a duo called "Dubios and McNamara" - who I believe also programmed many TRS-80 games.

VZ-Alive - and in your pocket!

As palmtops become more and more common, so emulators are beginning to pop up. Guy Thomason is working on *VZCE*, a new emulator which will run on Windows CE devices, particularly at the moment, the Cassiopeia. Check out http://homepage.powerup.com.au/~intertek/vzce/ if you like the idea of the friendly green BASIC display coming up on your handheld! It's even got a piccy of the VZ so you know which key is where!

After many years of loyal service, the VZeds were abandoned around 1988/9 when affordable PCs came out onto the market. Today, the VZed still lives on thanks to a few websites and emulators which allow fans to re-live their early VZed experiences once again.

The original portable VZ - the screen's a bit small for playing *Circus* on though! Better go check out Intertek's VZ-CE!

A footnote from an Editor...

First off, thanks must go to Jason "Waulok" Oakley for being the first contributor to our mag - Thanks Jason!

Secondly, it's worth pointing out that there's still plenty going on, thanks to Jason and others like him. There's an active VZ-Em mailing list which can be subscribed to from the main VZ-Alive page, and there are still people working on software for the VZ and its emulators. There is even a C cross-compiler to create VZ object code on a PC before transferring it to the VZ itself!

We'd just like to wish all the VZ'ers well in their quest for getting every piece of software ever written for the VZ archived - no mean feat, but they're doing a grand job so far!

Ian Gledhill

Links to the Outside World...

VZ-Alive	http://vzalive.bangrocks.com Home of the VZ emulators and newsletters.
M.E.S.S.	http://mess.emuverse.com Emulates the VZ (along with millions of other machines)
Dick Smith Electronics	http://www.dse.com.au Not much VZ here any more, strangely!

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UPGRADING THE AMIGA

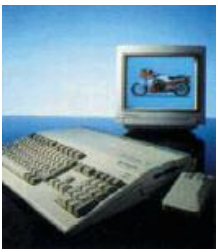
An Amiga is a great computer, considered the best machine of its time, but, lets face it dispite of what numerous amiga users say, it just wont fit to todays standards on its basic form, in this article we will have a look on how to get an amiga and how to get it rocking so that you can use it on a daily basis without the embarassment of having a slow and featureless computer, doing an upgrade will leave your amiga a prety useable machine, for example this mag is produced on the AMIGA and nothing else.

Getting the right machine

Amiga 1000

You get a 7MHz 68000, OCS chipset, 256KB of ram, no disk, no zorro slots , no easy memory expnsion, forget this one as a useable amiga, this is just a colectors item, and if so, try to get it boxed as this arent that rare indeed and get a sidecar, PC emulator, just for fun.

Amiga 500



You get a 7MHz 68000, OCS chipset on the basic A500 and ECS on the A500 plus model, 512KB or 1MB on the 500+ of ram, also no hard disk, though expansion isnt that hard because of the once big popularity of this system, there are many trinkets to attach to this baby, still, graphics are very hard to upgrade, forget RTG unless you get a Zorro Adapter, and it will always be a 16bit machine that wasnt disgned to be expanded, better leave this one alone too, unless you want a painfull upgrade path.

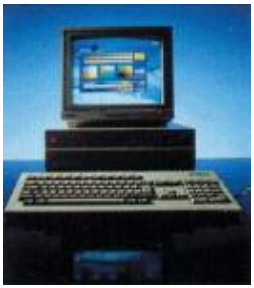
Amiga 600

With this you basicly get an Amiga 500 plus, with a IDE interface and PCMCIA connector, the smallest amiga of all, its not only a pane to upgrade but also nearlly impossible to do something decent of it, this was designed as a Home/Game machine, you can get some sort of accelerators, even a 68030 based one, but IMHO you should not consifer this machine nothing more than a toy or a semi portable system, some musicians use this baby to take a computer system on tour., really not a good option.

Amiga CDTV

This is a kickstart 1.3 machine, its more a advanced video/gaming system than a personal computer, you better leave this one alone, unless you want a cool CD player with some extra funcionality as a computer for games and so on, pretty cool piece of equipment never the less

Amiga 2000



Here ill talk about the A2000, A2500 and A1500 as these last 2 were nothing but variations of the first, this is the first amiga in this review that you can consider aquiring for real use, its still a 7MHz machine with OCS but its very easily upgraded since it has a LOT of zorro slots, and an inumerous number od 3rd patry stuff to put on them, but still, remeber, this is a 16 bit amiga and the transfer speed between the zorros slots isnt that great, but still many power house amigas are 2000s.

Amiga 3000

This is the first 32 bit amiga, for many the best amiga made since there are rumours that there were no money consens when making it, it was suposed to be the best and nothing less than that, there are 3 versions of this Amiga, the 3000, usualy known as 3000D, this is a desktop version a very slim case, and a pane to upgrade, not in expansion features but due to the small space available inside the box, and there is the 3000T a BIG box amiga that is absolutely the same as the 3000 in features but with extra zorroslots and much more space, there was also another variant of the 3000D wich was the 3000UX that runned a Amiga version of System 5 unix.

This amiga comes with Zorro 3 slots, the 32 bit version of Zorro 2 and SCSI built in, it also has a flicker fixer/scandoubler built in and its based on a 68030 processor and a 88881/2 FPU unit, the machine come with 2MB of ram and can be upgraded to 18MB without major problems, its just plug the chips in and your done (getting those chips is a completely different story...), all in all this is a great amiga to get, being the T version the most wanted)

Amiga 1200

The most expandable Amiga by todays standards, you can get all kind of bells and twistles for this machine, though it wasnt made for big expansion, being the low range amiga of the 32 bit generation made it a very popular machine, it has a 32 bit architeture based on a 68EC020 CPU, it has a IDE interface and a PCMCIA slot, it features AGA chipset and comes base with 2 MB of ram, a good choice for upgrade, but keep in mind that due to the design of the system upgrade isnt a pretty job and youl get plenty of wires, snap on chip boards, etc..

Amiga 4000

This one is another big box amiga like the 2000 and 3000, it has 2 versions, the 4000D and 4000T, both m,achines are easily expandeable and good machines for you to start, there are 2 flavours of 4000 cpus, the EC030 and the 040, the EC030 is no good for nothing except basic tasks since its even worst than the 030 that was in the 3000 and it lacks FPU unit also, then there is the 040 wich is quite faster but not as fast as other 040 based 3rd party accelerators, the machine comes with AGA chip set and 2 MB of chip ram, it has a IDE interface and can be expanded (on its basic form) to 18 MB as the 3000 could, but you could use standard SIMMs rather than the ZIP chips that the 3000 used for memory expansion, the 4000 could have a SCSI interface instead of IDE but commodore decided on IDE because of cost, the pic on the left shows the 4000T, the last Amiga produced, the Amiga 4000T had a built in SCSI interface and 2 Video-slots

Amiga CD32

This one was commodores atempt to enter the console market, once again a inovative concept as it was the first console to use a CD ROM for media, it really was a A1200 with a custom chip that allowed to make chunky to plannar convertion, with some exopansions it could be turned to a 1200 (SX 1 Module) and you could aslo place a FMV module to play CD-i movies.This unit can be turned into a full operational amiga, but there is little interest in upgrading it because there are no accelerators for it above 68030 and almost no other hardware availabe.

Upgrading, general concepts

Ok, so you finnaly got the machine, now its time to upgrade it to decent standards, please bear in mind that upgrading an Amiga is costy when compared with upgrading a PC, but in the end youl enjoy much more...

What to upgrade:

The most obvious thing to upgrade is the Processor, speccialy if you are upgrading a 1200, 2000 or 4000/030, you should look at the best you can get with your money, 040@40MHz at least, only go for the 030 solution if there really isnt no money to spend on 040/60/PPC, there are several kinds of processor upgrades, allways look for full processors (no EC, LC etc), and check if the processor isnt overclocked.
The graphics system is also important, no mather what people say all amiga native modes SUCK by todays standards, GET a graphics board ASAP, its better to have a A3000 with a 030 CPU and a RTG board than to have a 060 with ECS, belive me ive been through that, basicly its a resolution thing, you just cant seriouly use an amiga in antive modes, forget interlaced unless you have a flicker fixer, multiscan can be used but after you use your amiga on 1024x768 or better you wond be going back to that, thats for sure.
Memory is another must at least 32 MB to work without problems on basic stuff.
Upgrade the ROM to the latest kickstrt available, in this time its kickstart 3.1, with it you can get the latest OS installed, there are 2 ways of doing this, either by a softrom program or chip, the latest is prefered, leaving your amiga less prone to incompatablities and problably the way of using the first method is ILEGAL.
Hard disk and CDROM, still i belive no one thought on getting an Amiga without hard drive, Disk interfaces on the amiga are slow, specially IDE on the 1200 and it cant use disks bigger than 4GB.

Available Amiga Kickstarts, this listing is from original machines, there is nothing to stop you from using more recent kickstarts than the one originaly instaled on your machine.

1.1 - Used on Amiga 1000
1.2 - Used on Amiga 500
1.3 - Used on Amiga 500, 2000 and 3000 via magickickstart.
1.4 AKA Magic Kickstart - Not really a kickstart but a ROM that booted the kickstart image located under the DEVS directory on the boot partition of SCSI 6, this kickstart was used only on Amiga 3000.
2.0 - Used on Amiga 500plus, Amiga 2000 and Amiga 3000 either by using pure ROMS or via magickickstart.
2.04 - Used on Amiga 600.
3.0 - Used on Amiga 1200 and 4000.
3.1 - Used on Amiga 1200 and 4000.

Upgrading the Amiga 2000

The amiga 2000 is a rather old computer, to get to shape there is a significant amount of efort that you must go trhough, also you must remember that there are NO Zorro3 slots or PPC processor boards available for the amiga 2000 (ive read DCE is palnnig one in the near future), so to upgrade the 2000 the parts you will need to upgrade in first place are, they are not in any special order, you really must take all these steps.

1) Memory
2) Hard Disk Drive
3) Processor
4) Kickstart

There are 2 types of RAM that you should upgrade, chip and fast ram, chip ram is ram accessible to all Amiga chips and fast ram is ram available for the processor only.
CHIP ram can be expanded with a MEGACHIP kind of board that normaly replaces the fat agnus chip with a latter version and adds 515KB to 1.5MB of RAM.FAST Memory can be upgraded in 3 forms, either by a dedicated zorro2 memory board or a CSI/Memory zorro 2 board ,these 2 come normally with 8 megs of 16 bit ram there are many boards out there and they come pretty cheap wich is a sign that no one wants them anymore, take that as a sign....
The other option is a complete processor/memory option, wich is much more eficient because when you do a processor upgrade for a 32 bit processor like the 030 upwards, you will get local 32bit ram, wich is much faster, also there is a 8 MB limit on Zorro 2 Expansions.
A Hard Disk is also crucial for modern computing, the amiga 2000 has lots of options on this mater, you can get yourself a good HDD controler+memory very cheap, the only thing tou should look for is SCSI, forget IDE or even more strange propreatary interfaces you wont get HDDs for them, look for some GVP cards they come cheap these days and are very well built, pay special attention to the type of ram they use GVP has some models that use GVP proprietary SIMM that are very hard to come by.

Microbotics 8UP! Ram Card for Zorro II

Another thing to look for is , like for the memory, a Processor board (acelerator) with built in SCSI, these tend to be faster and more reliable.
The Processor Board is the most expensive upgrade of the 3 i mentioned, but also the most important, o good choice here can even replace the 2 prior upgrades, there are 2 kinds of processor upgrades, there is a kind of board that replaces the onboard 68000, avoid it,i wont even mention it anymore, and there is the processor slot card, there are many flavours of this cards, go for a 030 very least with built in memory too, but the thing you should really look for is for 040 boards with SCSI and RAM, and , if you have the money a 060, the DKB wildfire is the best your money can buy but not

GVP Impact Series SCSI controler + RAM

only is very expensive , it also is almost impossible to find. Again apy close attention to the type of memory your processor board takes, dont go for anything that doesnt use standard SIMMs you will regret it later when you cant find any memory to upgrade it. Also, take note that some Acelerator boards wont work without a kickstart upgrade.Upgrading the kickstart is also a simple metter, just get a 3.1 chip, take the one you have and put the new one in, these chips are easy to find in any good amiga shop.Having completed this part, you can go for more fancy yet important upgrades, go and get a Graphics card OCS graphics suck really bad, you wont use your amiga too long if you keep the OCS, also there is no built in Flickerfixer/Scandoubler for the 2000 so if you besides of the RTG graphics are going to need some Native 15KHz amiga modes, get a Flicker fixer / Scandoubler the A2320 does the job quite well, for the Zorro2 graphics card i think the picasso2 is a very good choice, though not cheap, and the Cybervison 64/3D wich is still in production is even better and faster, go get one, but make sure you get a RTG grfx card that is suporter both by Picasso96 and CyberGraphics software.

Cyberstorm 2060 Accelerator Card

OCS - Original chipset this chipset was used in early amigas, it allows up to 1 Megabyte of Chip RAM, and has rather limited graphics habilities, up to 32 colors in Lowres mode and 16 colors in Hires, you could put 64 or up to 4096 color in lowres using Halfbright and HAM modes.
ECS - Enhaced chipset, a litle improvement over the OCS chipset it suported 2 Megabytes of chipram, and a special Super Hiresmode wich could use 4 colors, ECS also suported productivity modes that allowed the use of a standard 31KHz monitor (VGA) on the Amiga.
AGA - Advanced Graphics Array, the latest Amiga chipset, with this you could use 256 colors on all modes, and about 252K color in HAM8 mode, it had a better suport of 31KHz monitors and flicker was reduced on interlaced modes.
Halfbright Mode - Special Amiga mode that doubled the colors displayed by using the original pallete colors and anoter 32 colors wich were half the RGB values of the original pallete.
HAM Mode - Hold and modify, this amiga mode was a trick that allowed to use tousands of colors, calculating each pixel color from the previous pixels colors.

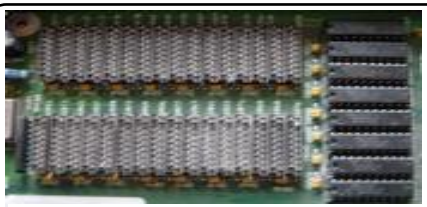
Upgrading the Amiga 3000

The Amiga 3000 can be a very good computer providing you make the right upgrades, on the right you see the computer on wich your mag is writen.

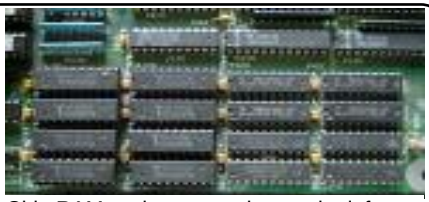
*****FIRST THING TO DO*****

When you open your A3000 please check the battery many 3000s are 'dying' because of battery leaks, carefully check the battery, look for leaks, small rust, small white crystals, either way if in doubt remove the battery, better to have no clock than to have no amiga.

The amiga 3000 is a pretty decent machine, in its base configuration, there are 2 main things that you MUST upgrade these are RAM and kickstart, the ram of the base 3000 is splited in 2 parts, chip and fast, from base almost all amiga's 3000 have 1 MB on the chip side and 1 MB on the Fast side, these are in the form of DIP chips, to begin this procedure get some memory in the form of ZIP chips or an AMIFAST board, then, remove the 8 dip chips from the fast slot (See left pic) and place them on the empty chip slots (see right pic).



Fast RAM sockets, note the ZIPs on the left and the DILs on the rigth, remove those to the chip area;



Chip RAM sockets, note that on the left they are on sockest and that on the right they are soldered dirctly inyo the Motherboard

Next put your new fast ram on the miggy, ide advise you to get the Amifast option, its cheaper to buy an AMIFAST and 2 SIMMs than to get the ZIP chips and BE VERY CAREFULL installing the board, you can KILL your miggy if you place it wrong, another option for this ram upgrade is to get a acelerator board with ram built in but


Amiga 3000 ROM tower

we will get to this latter. Another way to get some ram on your Amiga 3000 is via a DKB 3128 board, this is a Zorro 3 RAM board that allows up to 128MB of ram in a Zorro3 slot, the problem is that it isnt made anymore (Hope some manufacturer reads this and starts to make something of the kind, tip DIMMs would be great), and so its very hard to find as it is in popular demand and prices on ebay tend to be high. You should by now upgrade the kickstart chips on your board too, you will need it to use a 040+ based accelerator board, note that there are 4 ROMsockets on your 3000, if you have a REV9 board only 2 will be available if not there are 4 sockets and you WILL NEED a ROM TOWER a rom tower is a little board that behaves like an adapter between the modern rom chips and your amiga 3000.

The next step to make your 3000 better is to get a graphics card, get the best you can, Picasso IV is the best Zorro card there is, but since money is hard to get, go for a CV64 or CV64/3D that are cheaper and easier to find, speccially the last one that is still being made.your amiga 3000 even with a 030 will be useable with a GRFX card on it Now, i hope you got some money to spend, we are looking at accelerator cards, you should look for a card with memory built in, forget Commodore 040 and 030 cards used on the 4000, even if you have a 16MHz 3000, the commodore 030 only a 68EC030 and no FPU, and the memory access is slower, the A3640 is not a good card too, you might expirience hard times to install it, and only V3.1 works on the 3000 and its very hot and not that much faster than your 030 due to the slow ram access, use the A3640 only if it is very cheap and you cant really get another card. A decent accelerator would be any cyberstorm 680x0 based card or even better a PPC card, just remember to check for the working temperature if you have a 3000Desktop, speccially on 040 based ones as 060s are cooler than 040s, but much more expensive to.anymore (Hope some manufacturer reads this and starts to make something of the kind, tip DIMMs


Cyberstrom PPC card


Commodore 3640 card

All in all, if you want to get an amiga to upgrade, go for the 32 bit machines, these will give you more expandabilitie for less money and also take care that there is NO PPC solution for A2000, DCE are planning to do one, but i wouldnt hold my breath, in your list of upgrades there is a special kind of thing that you might consider, the PCI interface, you can get several kind of PCI adapters that will allow you to connect cheap PC PCI devices in your amiga, in my opinion, the one that provides more security for your investment is the PROMETHEUS, wich plugs into any Zorro3 slot and gives 4 pci slots.
PCI is still a very imature technology on the amiga and drivers are a tad imature, but due to the opensource scheme of the prometheus this may very well change

Resources:

The Big Book of Amiga Hardware : WWW.AMIGAHARDWARE.COM

This great reference will tell you more than you need to know about amiga Hardware

Agree ? Disagree ?

Mail us your opinion, you are the main reason for us to be writng this magazine, we do need your feedback.

Next Month :

Next issue we will take a look on how to upgrade an Amiga 1200 and 4000, we will take a look at the PCI panorama in the amiga world.

Jorge Canelhas
27 September 2001

Watching the WEB

Browsing the web is difficult on an 8-bit usually - but that doesn't mean there's nothing there for them.
Here's some interesting sites to look out for... also check out the Links tab on our webpage *http://www.retroreview.com!*

www.raww.org
Spectrum Demoscene is the order of the day here... or maybe check out a diskmag which can be found at
papaya.raww.net
which is the home of the Subliminal Extacy disk magazine.

www.algonet.se/~rsm/zx/
Interested in Speccy Clones? If so, here's a site with info on all sorts of Sinclair clones from the ZX80 to the QL.

uzix.sourceforge.net/
No less than UNIX on an MSX 2! Run PINE and even graphical web-browsers on your 8-bit!

rivet.50megs.com/cssfolk.html
For a dose of madness, see the comp.sys.sinclair folklore FAQ. Abandon sanity all ye who enter here...

www.z88forever.org.uk/zxplus3e
A new ROM for your +3/+2A/+2B! Use standard IDE harddisks!

www.ysrnry.co.uk/
Superb tribute to arguably the best computer mag ever - Your Sinclair.

www.zzap64.co.uk/
It`s not just YS with an online tribute site... C64 owners need go here!

www.intellivisionlives.com/
Home of the only legal Intellivison emulator. Also a load of Inty-based info from the Blue Sky Rangers.

www.classicgaming.com/vcsp
The portable Atari VCS and now the portable SNES!

www.io.com/~nickb/atari/
So you call yourself a coder? Then try coding for the Atari 2600 using this great page. If anyone gets anywhere send it to us, we`d love to see it!

oric.free.fr/
All sorts of Oric info here, along with software and tools.

More links next month - got a good link for us? Send it in!

In the early 80's the Portuguese market was flooded with ZX Spectrums: that was the most popular computer in the market and almost everyone who owned a computer had a ZX Spectrum. However, many of the ZX Spectrum owners weren't real Sinclair Spectrum owners but Timex Computer 2048 owners. This machine was a better Spectrum than the original: to the less enlightened people it was a Spectrum with a built-in kempston joystick interface, a much better keyboard, that was not just superior ergonomically (mostly because of the real space bar) but the quality in the mechanics was better. Even these days most broken Timex keyboards can be cleaned with alcohol.

This article will explore the machine beyond the physical differences and exploit some hardware secrets that made the computer a little incompatible with the original ZX Spectrum. In the top Picture can be the screen from the demo tape that came along with the TC2048.

Timex Computer 2048

Timex Computer 2048 Board

The Timex Computer 2048 was launched in Portugal only - do not mistake this computer with the prototype Timex Sinclair 2048 wich was intended to be a 16KB version of the Timex Sinclar 2068. The Timex Computer 2048 was a ZX Spectrum clone and featured:

- Z80A CPU clocked at 3.58 MHz
- 48KB of RAM
- 16 KB ROM (Almost the same as the ZX Spectrum)
- Edge connector compatible with the ZX Spectrum, but missing RGB signals, and the /BE signal.
- RF out connector.
- Ear / Mic Connectors
- Kempston Joystick Connector.
- Extended screen modes when compared with the ZX Spectrum;
- On/Off switch.

On the business scene the TC 2048 was a fairly well-used computer in Portugal, especially connected to a FDD 3000 system. This system gave 64KB more to the TC2048 along with 2 disk drives. It was in fact another machine as it featured a Z80 of its own. The FDD gave the TC the ability to run CP/M which was the most used business-oriented OS of its time. There was even a separate, almost professional keyboard that you could use with it. It was the game market, though, which was the real target for the TC2048, where it was designed to battle hand to hand with the Spectrum. Many shops sold it as a natural alternative to the ZX, 'This is a machine that is not only a toy but a serious computer' i can almost hear the salesman voice saying...

The Machine

As soon as you open the Timex's box, you notice the big resemblance with the ZX Spectrum (it couldn't be other way, it's a clone!). The keys are very similar, but in the Timex are made of plastic instead of rubber. You also notice a joystick connector of the de-facto standard kempston type. An ON led is also welcome as is the on/off switch. Under the hood the differences are even greater, you get a better quality computer when compared with the Sinclair - the most evident is the plastic

Rom differences between the ZX Spectrum and the Timex Computer 2048.

Address	TC2048 ROM	ZX Spectrum ROM
129A	Call 386E	Call 0C0A,PO-MSG
386E	Out(FF),A	FF
3870	Call 0C0A,PO-MSG	FF
3873	RET	FF

The TC2048 Boot Screen, exactly the same as the ZX Spectrum's one!

keyboard, which was better not only on the exterior but on the interior where a good PCB replaced the fragile membrane of the Spectrum. The keyboard PCB uses a mechanism similar to many calculators where a special rubber that acted also as spring made contact between the tracks of the PCB, thus allowing the keystroke to be sent to the computer. The composite output also gave the Timex a more professional touch, and in this machine there was no need for a separate joystick interface, as the kempston interface was already built in. Plus, the typical unplug/replug reset procedure was replaced with a good quality ON/OFF switch and you could see if your timex was turned on by the red led on top instead of the high frequency whistle you could hear from the ZX Spectrum's speaker (many friends of mine said they couldnt hear a thing from the speccy, but I swear, I could!). One thing that you could still complain about in the machine is the poor quality ink used on its keyboard- it rubs off with use! Many of todays 2048's have the keywords of some keys worn off, especially Q,A,O,P keys, who knows why...

One less known feature of the TC2048 is the Enhanced graphics capabilities. The TC 2048 used the very same ULA as the Timex Computer 2068 (Note the 'Computer', it's Timex Computer NOT Timex Sinclair). This ULA had - besides all ZX Spectrum modes - some graphics modes of its own. They were used widely in conjunction with the FDD 3000 so it could display the 80 character text that was used by CP/M applications (the main use of the FDD3000).

How to use the TC 2048 Modes:

To use the special 2048 modes you will need to output to port 255, bits D0, D1 and D2. You can output all 8 values but only 4 will give you some kind of good result:

- **000** - 8X8 Attributes, just like the normal ZX Spectrum**.**

- 001 - Puts video data at 24576 and STTR data on 30720, it still keeps 8X8 attributes.
- 010 - Multicolour mode, keeps video data at 16384 and 8X1 color attributes at address 24576.

- 110 - No colour attributes, Extended resolution: this mode takes the video data from 2 different areas: even columns are taken from address 16384 and odd columns are taken from address 24576.

Timex Computer 2048 and 2068 ULA.

Expanding the Timex 2048

What were the Timex Computer 2048's expansion options ? Well, the TC had the same edge connector that was present on the ZX Spectrum, although some signals are unconfirmed on it. It could use most simple ZX Spectrum interfaces and some of the more complex too, but some, for example the Rotronics Wafadrive, didn't work well on it - maybe because of the NEC processor (Z80 Clone) or by some missing sign or ROM incompatability. The wafadrive can write to wafers but can't read them on the TC, so probably some other cpomplex peripherals have the same problem. Not to worry, though, because as soon as you take a peek at Timex's own options there is hardly any need to search in another brand! There are Sound Amplifiers, Disk interfaces, the famous and rare FDD3000 (which was indeed a true computer of its own), serial interfaces, and so on. One that I like especially is the 3 part disk interface, the Timex FDD, wich is compatible with DD 3 1/2 disk drives. Just remove the incompatible 3 incher that comes along with the unit and plug in the floppy of your choice (See the pic below).

All in all the Timex Computer 2048 was a very decent and cheap machine that had a great impact on videogaming in Portugal. It was superior to the ZX Spectrum and it's a pity that there were almost no games that took advantage of its superior video architecture. Timex Portugal was one of the best computer developers of its time and delivered us some stupendous machines. Contrary to the Timex Computer 2068, this model was never exported or distributed outside Portugal, making it difficult for anybody with no access to the Portuguese market to get one. This is definitely a computer that has a place in every serious collector's collection.

Promo Picture of the TC 2048 with the Timex FDD System.

Special Thanks to Johny Reed from http://timex.123go.cx

Jorge Canelhas

As recently as 1987 some fine games were coming out on 8-bit machines like the under-rated MSX. *Ian Gledhill* takes a look at what some call the MSX's finest hour.

A shooting star crosses the sky watched only by one small, brave penguin. Reminding the little chap of his lost love, he vows to go after her. Awwww. Who says that computer games can't be romantic?

Certainly Penguin Adventure is a refreshing change from the usual blood element of most games - relying purely on arcade gameplay, using a traditional formula but developing it to a great level. Unfortunately, exactly what level I'm not sure, as it's also very difficult!

Our penguinesque hero starts off racing through a forest avoiding holes in

Yes, they can be infuriating, but not so much that the replay value is spoiled...

the ground and catching fish. Hardly sounds terribly exciting, does it? And of course it doesn't need to be, as each level is progressively harder. Level 2 places you underground, but without introducing too many hazards. In fact it's the ice level 3 where the fun (and infuriation!) starts, with the introduction of small bouncing beasties for our

Even penguins can fly if they can find a handy cloud to give them a lift...

penguin to avoid. And yes, they can most definitely be infuriating, but not so

much that the replay value is spoiled, thankfully. Hitting a crater (from where the fish fly, obviously) will stop our hero in his tracks, quite often, unfortunately, straight into the path of a bouncing thingummyjig.

Anyone playing the first few levels will not be expecting the end of level 3 to be as it is: after all, how can you have an end-of-level baddie on a

Jump for those fish, little Penguin, Jump!!!

running/avoiding game? But anything's possible in the world of Konami: in this case, a manic polar bear. Luckily the ice around this particular bear is a little weak, so our penguin chum must leap on the ice on the weak spots until the ice under the bear gives way- there's certainly a lot of imagination gone into this game. After level 3 things get really difficult: I presume level 5 is harder than level 4 but as I haven't been any further I can't comment!

Naturally, there is more a penguin can do than just run and jump - he can

There's certainly a lot of imagination gone into this game...

actually fly - with a little help! Grab a particular coloured heart as it floats across the screen and you're on Cloud Nine. Well, on *a* cloud, anyway. Ever so useful for avoiding tree trunks carelessly left strewn over the ground. Or use your fish that you`ve been collecting to buy other power ups - nothing like a Colt .45 to get rid of those bouncing enemies. If you can`t afford it yet, take some time out on the fruit machine and gamble your fish to win more fish! Lucky the natives are so keen on fish.

For this game to run on 1983 hardware is very impressive: the scenery whooshing towards you as you race towards the finish actually looks like it's moving, even though the moving screen covers more than half of the display area. This is coupled with a great soundtrack which really adds to

Finding Penguin Adventure

The MSX is a well supported machine on the internet, and because of the joy that is MESS, you can run it on almost any machine fast enough - or there may be a port of fMSX for your machine (Hans Guijt's Amiga version is excellent). However, the best way to experience games like *Penguin Adventure* must be the original format - the cartridge. Unfortunately (or fortunately depending on how you look at it) MSX cartridges are popular at the moment, and you could easily be looking at $15 for even an unboxed cart at auction. Storage of the cart is not a problem - my cart lives in my Pioneer PX-7 cartridge slot....

the atmosphere of the game- a nice fast track to start on level 1 in the forest changes to a much darker, broody sound when you enter the cave level 2.

Perhaps what really stands out about this game is the polish -

Gambling is apparently evil. But also a dead good way of getting that all-important powerup for your penguin.

everything moves smoothly, no unexplained delay or jerky gameplay, everything fits together wonderfully, and yet the programmers have fitted a great amount of embellishments into a small cartridge. Throughout the game, the penguin is given a definite character, such that you actually feel for the little fella! It's the little touches (many of which are very Japanese) which create the atmosphere provided by *Penguin Adventure*, and it really helps.

What Konami have done is taken a very primitive game idea, and enhanced it with power-ups, bad guys and a whole spadeful of atmosphere, and it really works! They've maintained a decent level of difficulty (even on difficulty level 1) but kept a good amount of replay value in the game - something which most designers strive for but very few ever realise. If you own an MSX and want a good, playable game for it, Penguin Adventure should provide you with the enjoyment you need.

Penguin Adventure
Konami

Graphics	9
Sound	9
Playability	9
Longevity	8
Overall	9

Links to the Outside World

www.msx.org	All things MSX.
mess.emuverse.com	The MESS homepage. Very handy for running MSX and MSX2 games.
www.fmsx.org	Marat Fayzullin's excellent MSX emulator.

retro REVIEW

Auction Review

Retro Review is glad to provide to her readers a price chart for the most popular retro computers in the market. As you probably know by now, it is very hard to set a price tag on a particular machine, since we are rarely referring to new, off-the-shelf machines: many factors come into the equation here, so to try to make things simple we use a High-Low-Medium chart. Please note that this is only a reference, a record of prices previously fetched by a machine. Prices are picked from popular auction sites and we list the lowest price, the highest price, the number of samples and the average of all samples. We do not look at included peripherals, damaged computers or anything else; if it is a Sam Coupé, it's a Sam. no questions asked. For Example :

	Low	Med	High	Samples
L@@K R@RE MACHINE	2	13	50	14

This, would mean that from 14 Auctions that included a L@@K R@RE MACHINE, (disregarding the condition or additional items) the one that had the highest final bid sold for 50, the lowest was 2, and the average of all 14 samples was a value of 13. Therefore, for a machine in average condition, you should expect to pay 13.

Perhaps of most interest to the passive collector is not the value (which in many cases is artificial) but rather the quantity that have been sold, as this provides a fairly accurate picture of rarity. It should, however, be remembered that certain machines can't be categorised as easily as others. For instance, a Spectrum 48K+ is a Spectrum 48K+. However, is an Atari ST an Atari 520ST, or a 520STe, or a 520STFM? It is very common that machines like the ST do not have a full description and so can't be taken into account (genuine Atari 520STs are actually very rare!). Also some machines are more likely to come with extra peripherals, which prevents us from using them: for instance, BBC 'B's are likely to come with disk drives. Nonetheless we can still glean the relative rarities from a combination of the price and the quantity sold.

Why Auctions ?

Despite contrary opinions from many people, we do believe that big auction sites provide the most accurate value for a machine. Why ? Simply because thanks to our capitalist society the monetary value of something is exactly how much people are willing to pay for it. OK, you bought your XPTO machine in a legendary car boot sale for YYY bucks, but is that a reliable source ? Can you find another for the same price? Most problably not, thats why big auction sites are good reference, you can almost always find what you need, albeit for a maybe not so cheap but realistic price.

Jorge Canelhas

A typical month on an auction site will have a number of common computers, but with a few rare machines in for good measure. The last 6 weeks have been no exception, with one machine being completely unknown to anybody!

Question: When is a rare machine not so rare?

Answer: When it's a ZX80 or a Spectrum 128K+, that's when.

Ask almost any retro collector what the rarest Spectrum and the rarest Sinclair machines are and he'll say the ZX80 and the Spectrum 128K+. However, in 6 weeks only, I saw no less than SIX of each. That's one a week. To put this into perspective, there were no Jupiter Aces, one PET 2001, two Oric-1s, and six VIC-20s (which nobody will claim is rare).

It is true that there is a phenomenon sometimes referred to as "The eBay Effect", where if one machine sells well, another ten will appear. This is undeniable, but still it shows the relative scarcity. PET 2001s regularly achieve prices over $350, yet only one showed up. Orics usually find prices over $100, yet there were no Atmoses and only 2 of the Oric-1s. It's not just computers, either. The well known Vectrex (supposedly very rare) came up with four items, and that was just the ones we could use! There was at least one other that came with too many games for us to use as representative of the market. Yet still they find prices around the $170 mark.

And then, of course, is the flip-side of the coin. Take the Atari Portfolio: one showed up and it sold for a massive $25. Or the Atari 130XE - again, one was sold, for a massive $17.
Remember, these are fully working machines. Then there was the Commodore 128D which sold for a measly $18.

A large proportion of the price differences are down to location. The most striking example being the Texas Instruments TI99/4A. If you want one of these machines, buy it from the USA. One of them didn`t sell (again, in fully working condition) - and the starting bid? $5. Yet over in Australia a similar machine sold for over $80.
Probably the rarest machine on auction was a Sekon. The seller didn`t know what it was - presumed it was an Apple clone, owing to the expansion slots and shape of the case. It seemed to be a genuine home computer rather than a terminal as it had a casette interface, but he couldn`t say more than that. As we intend to do with all weird and obscure machines, we've saved the photos of the machine for anybody who thinks they know what it is! Answers on a postcard please....!
We hope you find the table useful.

Ian Gledhill

Computer name **Prices in GBP (1 GBP = aprox 1.5 USD)**

	Low	Average	High	Quantity
Acorn A3000	5.00	13.00	21.00	4
Acorn A3010	11.50	23.75	36.00	2
Acorn A3020	5.00	13.80	21.00	5
Acorn BBC B	8.00	16.88	37.00	4
Acorn BBC Master	5.50	25.75	46.00	2
Acorn BBC Master Compact	23.00	23.00	23.00	1
Acorn Electron	5.00	9.77	21.50	8
Apple][c	28.00	55.00	82.00	2
Apple][c+	40.50	40.50	40.50	1
Apple][GS	18.50	18.50	18.50	1
Apple Macintosh	143.00	178.00	213.00	2
Apple Macintosh Classic	25.00	38.00	51.00	2
Apple Macintosh SE	11.00	19.67	27.00	3
Amstrad 464 +	15.00	15.00	15.00	1
Amstrad 6128 +	21.00	30.50	40.00	2
Amstrad CPC 464	2.00	11.37	17.00	4
Amstrad CPC 6128	6.50	14.38	26.00	4
Atari 520STFM	11.00	17.33	23.00	3
Atari 1040STF	10.50	15.33	21.00	3
Atari 65XE	5.00	14.75	20.00	4
Atari 130XE	11.50	11.50	11.50	1
Atari 800	41.00	81.33	160.00	3
Atari 800XL	10.50	26.69	60.00	8
Atari 1200XL	59.00	64.00	69.00	2
Atari Portfolio	15.00	15.00	15.00	1
Bandai Pippin	79.00	79.00	79.00	1
Commodore +4	20.00	38.00	56.00	2
Commodore 16	8.50	11.17	15.00	3
Commodore 64	3.00	15.43	23.00	15
Commodore 64C	3.00	10.75	17.50	16
Commodore 128	9.00	13.00	17.00	2
Commodore 128D	12.00	56.50	102.00	2
Commodore Amiga 500	10.50	16.78	31.00	18
Commodore Amiga 500+	10.50	16.37	28.00	8
Commodore Amiga 600	10.00	17.90	41.50	10
Commodore Amiga 1000	18.00	18.00	18.00	1
Commodore Amiga 1200	15.00	30.25	41.00	16
Commodore Amiga 3000UX	200.00	200.00	200.00	1
Commodore Amiga 4000/040	200.00	227.00	254.00	2
Commodore CBM 4032	50.00	50.00	50.00	1
Commodore KIM-1	97.00	146.00	195.00	2
Commodore PET 2001	211.50	211.50	211.50	1
Commodore SuperPET 9000	136.00	136.00	136.00	1

Commodore SX-64	184.00	184.00	184.00	1
Commodore VIC-20	7.00	36.25	66.00	6
Dragon 32	31.00	46.50	62.00	2
Dragon 64	138.00	138.00	138.00	1
Epson HX-20	14.00	21.00	28.00	3
Eurocom-1	69.00	69.00	69.00	1
JVC HC-7GB	38.00	38.00	38.00	1
KayPro 2	18.00	18.00	18.00	1
Mattel Aquarius	18.50	18.50	18.50	1
Memotech MTX 500	51.00	51.00	51.00	1
Olivetti Prodest PC128	15.50	15.50	15.50	1
Open University Hektor II	52.00	52.00	52.00	1
Oric 1	40.00	40.50	41.00	2
Osborne 1	133.00	133.00	133.00	1
Philips Videopac G7000	11.00	18.67	30.00	3
Sekon	72.00	72.00	72.00	1
Sharp MZ-700	16.00	56.17	82.50	3
Sharp PC-1500	7.00	28.83	42.50	4
Sharp PC-1501	20.00	20.00	20.00	1
Sinclair QL	23.00	62.80	102.00	5
Sinclair Spectrum 16K	21.00	38.33	52.00	3
Sinclair Spectrum 48K	4.00	28.41	88.00	34
Sinclair Spectrum 128K	35.00	56.50	101.00	6
Sinclair Spectrum +	10.50	21.24	74.00	23
Sinclair Spectrum +2	10.00	20.42	51.00	13
Sinclair Spectrum +2A	14.50	22.79	36.00	7
Sinclair Spectrum +3	8.00	32.50	75.00	6
Sinclair Z88	16.00	35.00	51.00	4
Sinclair ZX80	90.00	214.00	325.00	6
Sinclair ZX81	2.50	43.56	80.00	18
Sony Hit-Bit HB75B	39.00	39.00	39.00	1
Tatung Einstein	60.00	60.00	60.00	1
Tandy 100	14.00	51.50	89.00	2
Tandy 102	30.00	47.50	60.00	3
Tandy TRS-80 MC-10	13.50	13.50	13.50	1
Texas Instruments TI99/4	134.00	134.00	134.00	1
Texas Instruments TI99/4A	6.00	12.43	31.00	7
Texas Instruments TI99/4A (Mk. II)	4.50	16.83	37.50	3
Texas Instruments TI CC-40	43.00	43.00	43.00	1
Thomson TO9	21.00	21.00	21.00	1
Timex Sinclair TS1000	14.50	18.13	25.00	4
Timex Sinclair 2068	53.00	53.00	53.00	1
Tomy Tutor	72.50	72.50	72.50	1
Toshiba HX-10	12.50	23.64	41.00	7
Unipolbrit 2068	156.00	156.00	156.00	1

Consoles

Acetronic MPU 1000	2.50	5.50	8.50	2
Amstrad GX-4000	5.50	20.50	18.50	6
ATARI 2600 (6 switcher)	10.50	33.07	71.00	7
Atari 2600 (Darth Vader)	20.00	20.00	20.00	1
Atari 2600 Jr.	5.00	17.33	16.00	3
Atari Jaguar	24.00	24.00	24.00	1
Atari XEGS	12.50	15.75	12.50	2
CBS ColecoVision	16.00	18.75	21.50	2
Commodore Amiga CD32	32.50	29.67	40.00	3
Commodore CDTV	50.00	50.50	51.00	2
Mattel Intellivision	20.00	20.00	20.00	1
MB Vectrex	94.00	107.75	128.50	4
NEC PC FX	82.00	82.00	82.00	1
Nintendo NES	25.00	35.50	46.00	2
Panasonic 3D0 FZ-10	31.00	31.00	31.00	1
Philips CDi 220	60.00	60.00	60.00	1
Sega Master System	20.00	21.50	23.00	2

Buying Tips

Before buying a computer for your collection there are some steps that you should take to avoid latter problems:

Search Locally > Before going to an auction site or web shop to get that computer you want, take a look in your area, maybe you can find what you want near you.
In Auction sites, ask before bidding > Nothing more easy than to ask the seller when in doubt, do NOT assume anything, contact the seller, ask everything you dont know about the item, check the Power needed, many countries use 110v and others 220, check the output type for monitor, is it PAL ? NTSC ?
Avoid sold asis and not tested item auctions > Ive seen many *untested* ZX Spectrums, usually this means not working but it is your problem, how hard is it to test a ZX Spectrum ?
Check the sellers feedback > It usually shows how honest the person is.
Bid the closer to you as possible > P&P for old computers often are greater then the price of the machine.
Check the condition of the Machine > is it scratched ? Boxed ? Remember the closer to the item you found in the stores years ago the better.
Get the most you can get > This is almost obvious, the most periferals you get the better.
Never send Money by mail > Use Money Orders or other types of online payment, this makes things more dificult for disonest people.
See Various sites on various countrys > Prices change from country to country, things common in the UK can be Rare in Portugal and Vice Versa, if you can get it cheaper in the origina country of the machine, look no further.